(2015)

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MATHEMATICS

Nationality		No.	
Name	(Please print full name, underlining family name)		

Marks	

Note that all the answers should be written on the answer sheet.

1. Fill in the following blanks with the correct numbers.

(1) When $a>0$, then what is the range of x that satisfies the following inequality:

$ax^2-3ax+2a<0$

$\boxed{①}<x<\boxed{②}$.

(2) If $4^{3x-1}-2^{5x-4}=0$, then $x=\boxed{\quad}$.

(3) $10^{\log_{10}5}=\boxed{\quad}$.

(4) When α and β are the solutions of the quadratic equation $x^2-5x+3=0$, then $\alpha^2+\beta^2=\boxed{①}$, $(\alpha-\beta)^2=\boxed{②}$.

(5) When $|\vec{a}|=1$, $|\vec{b}|=2$, $|\vec{a}-\vec{b}|=\sqrt{7}$,then the degree measure of the angle between $\overrightarrow{a}$ and $\overrightarrow{b}$ is $\boxed{\quad}$ ° .

(6) When △ABC is a triangle where ∠A=30°, then sin(∠B+∠C) is $\boxed{\quad}$.

(7) How many multiples of 3 are there among integers from 100 to 200?

The answer is $\boxed{①}$, and the sum of those multiples of 3 is $\boxed{②}$.

(8) When x^3+ax^2+bx+5 is divisible by $x-1$ and has a remainder of 5 when divided by $x-2$, then $a=\boxed{①}$, $b=\boxed{②}$.

(9) Let $f(x)=|x^2-1|$. Then $f(0)=\boxed{①}$, $\int_0^2 f(x)dx=\boxed{②}$.

(10) Assume that a , b and c are consecutive terms of arithmetic progression $(a<b<c)$. If $a+b+c=24$ and $abc=440$, then

$a=\boxed{①}$, $b=\boxed{②}$, $c=\boxed{③}$.

2. On the plane xy, there are four points ; O (0,0), A (0,3), B $(0,-3)$, C (4,0).

Fill in the following blanks with the correct numbers.

(1) The equation of the straight line AC is $\boxed{①}x+\boxed{②}y-\boxed{③}=0$

(2) The coordinates of the circumcenter of $\triangle$ABC are $\left(\dfrac{\boxed{①}}{8},\boxed{②}\right)$.

(3) When point D is the intersection of bisector of $\angle$ABC and $x-$axis, then OD : DC = $\boxed{①}$: $\boxed{②}$ and the coordinates of the inner center of $\triangle$ABC are $\left(\dfrac{\boxed{③}}{2},\boxed{④}\right)$.

3. The line (a) ; $y=x+k$ (k is a constant) is tangent to both the parabola (b) ; $y=x^2-5x+7$ and the parabola (c) ; $y=x^2+3x-1$.

Point P is the point of tangency of the line (a) and the parabola (b), point Q is the point of tangency of the line (a) and the parabola (c) and point R is the intersection of the parabola (b) and the parabola (c).

Fill in the following blanks with the correct numbers.

(1) The constant $k=\boxed{\quad}$.

(2) The $x-$coordinate of the point P is $\boxed{①}$, the $x-$coordinate of the point Q is $\boxed{②}$ and the $x-$coordinate of the point R is $\boxed{③}$.

(3) The area surrounded by the line (a), the parabola (b) and the parabola (c) is $\boxed{\quad}$.